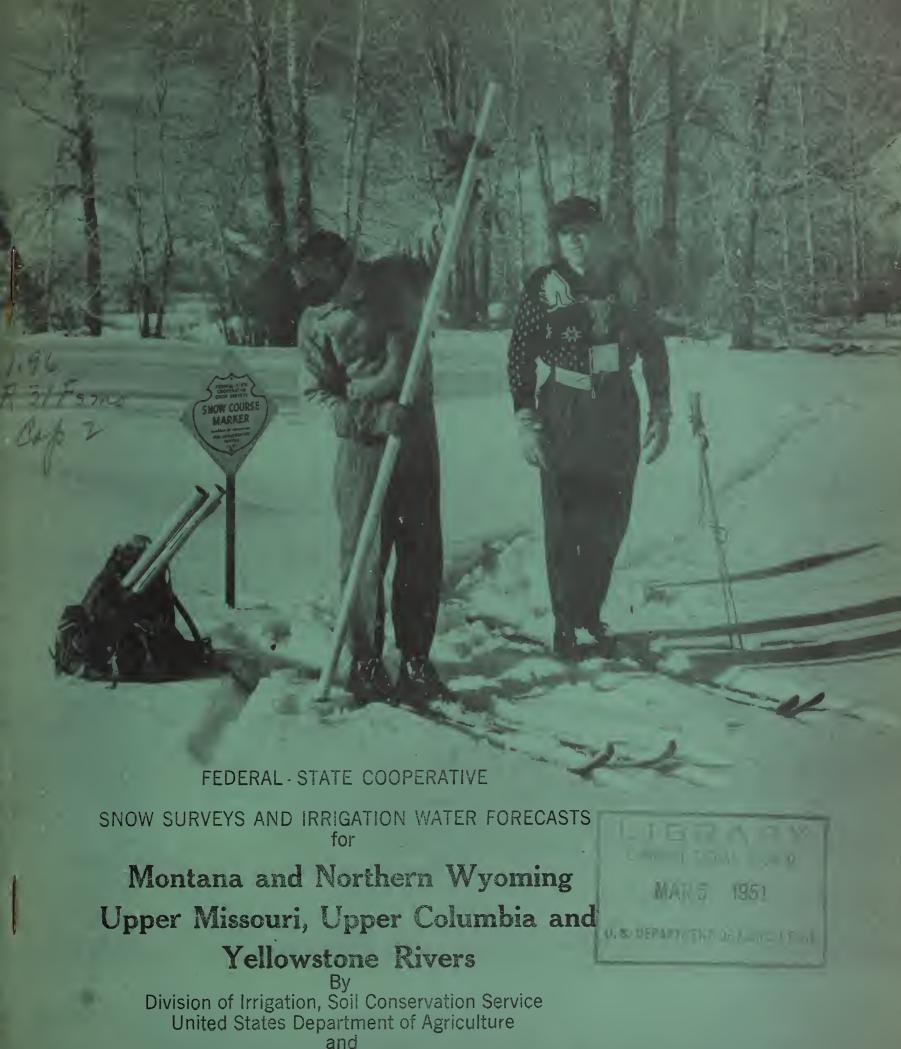
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In cooperation with the U. S. Forest Service, U. S. Geological Survey, National Park Service, U. S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and local organizations.

Montana Agricultural Experiment Station

As of

FEB. 1, 1951



FEDERAL-STATE COOPERATIVE SNOW SURVEY AND IRRIGATION WATER FORECASTS

FOR

MONTANA and NORTHERN WYOMING

Upper Missouri and Upper Columbia River
Basins

Report Prepared by

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OUTLOOK FOR 1951 AS OF FEBRUARY 1, 1951

Snow survey measurements made on or about the First of February at a few key stations over the Upper Missouri River Basin indicate that the snow pack is very close to average conditions. Comparative data indicates about 10% above average in the northwest to 2% below average in the southwest. The central portion of the basin is about average. Northern Wyoming Basins indicate a very similar condition, however, some of the older courses show a higher percentage of average than do the courses with a short period of record. In general there is less water in the mountains than for the last two years.

Valley precipitation station data close to the foot of the Rocky Mountains shows a slight plus deviation from the normal, while the stations farther east show a decided minus deviation. Valley precipitation stations in Northern Wyoming show a decided minus deviation, while the snow pack measured indicates a close-to-average condition. In some cases on the Wind River, as much as 50 to 70% above average water content is common. These opposite deviations will present a problem in forecasting at a later date, with the minus precipitation.

Stream flow conditions on the Upper Missouri have remained above the median during the season until the cold snap in late January when a decided drop was noticed.

Water storage throughout the state is in all cases better than last year and considerably above the average in most reservoirs.

Snow measurements made on the Upper Columbia Basin indicate a slightly above-average condition, judging from the stations that were measured. Precipitation stations in the area show a consistent positive deviation from the normal accumulated rainfall from October to date. Water in storage is considerably above last year and well above the 10-year average 1940-49.



MISSOURI RIVER BASIN		Reservoir Vo	olumes in 1	LC,000's o	f Acre Feet
RESERVOIR	Location on or Diversion from	Usable Capacity		Contents r Last Year Feb. 1 1950	
Lake Sewall	Missouri	37.8	23.6	29.2	23.0
Hauser Lake	Missouri	52.1	41.3		· .
Ft. Peck Res.	Missouri	19,000.0			9,296.0
Ruby Res.	Ruby	38.5		11,200.0	7,270.0
Harrison Lake	Willow Cr.	17.8	G 3		_
Hebgen Res.	Madison River	345.0	239.2	207.6	227.1
Madison Res.	Madison River	41.0	30.8	34.3	34.4
Smith River Res.	Smith River	10.7	J0.0	7407	24.04
Gibson Res.	N.Fk. Sun River	105.0	75.4	34.1	56.5
Willow Creek	N.Fk. Sun-Willow Cr.	32.3	23.1		
Pishkun Res.	N.Fk. Sun River	32.0	19.0	19.2	18.7
Lower Two Medecine L.		1/4.0	17.0	1702	10.7
Four Horns Res.	Badger Creek	20.0		5.9	7.9
Birch Creek Res.	Birch Creek	30.0	24.9		21.0
Lake Francis Res.	Birch Creek	112.0	93.8	81.7	75.9
Ackley Lake	Judith River	5.8	// ₀ 0	01.7	4.3
Durand Res.	N.Fk. Musselshell	7.0	5.4		407
Dead Man Basin	Musselshell River	52°5	J04	=	
Martinsdale Res.	So.Fk. Musselshell	23.1	12.8	-	
Fresno Res.	Milk River	127.2	68.6	8.3	44.4
Nelson Res.	Milk River	66.8	-	5.4	4404
Mystic Lake	W.Rosebud Creek	20.8	11.9	10.9	8.5
Cooney Res.	Red Lodge Creek	27.5	==0/	10.7	6.9
Tongue Res.	Tongue River	73.9	8.1		7.9
Sherburne Lake Res.		66.1	23.3		19.8
Lake Helena	Missouri River	10.4		3.0	2700
YELLOWSTONE RIVER BA			J ∘ –	700	
Buffalo Bill	Shoshone	456.6	305.9	203.9	271.0
Sunsh ine	Greybull	52.0	2-2-2		
Pilot Butte	Wind River	30.1			
Bull Lake	Wind River	155.0			
COLUMBIA RIVER BASIN	Г				
Georgetown Lake	Flint Creek	31.0	25.2	18.8	6
E.Fk. Rock Cr. Res.		16.0	-		•
Nevada Creek Res.		12.6	•		-
W.Fk. Bitterroot Res.	W.Fk. Bitterroot	31.7	10.0	0.6	7.0
Como Lake	Rock Creek	34.8		650	· es
Flathead Lake (Sommers)Flathead River	1,791.0	1,107.0	958.1	559.5
Little Bitterroot	Little Bitterroot *	37.1		26.5	
Dry Fork Res.	Dry Fork Creek *	6.7	39.6	A	5
	Mission Valley				
Reservoirs	(Flathead River) **	105.0	44.1	24.1	-

^{*} Comprise two reservoirs on Dry Creek

^{*} Comprise two reservoirs on Little Bitterroot River

^{**}Comprise nine small reservoirs on Mission Valley Project Indian Reclemation Service



PRECIPITATION DATA FOR FEBRUARY 1, 1951 MONTANA

	Day 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Departure	+1,19	\$0°04	+13.22	40°/16	44.52	10.28 10.59 10.59 10.07 10.18 10.73	10.20 -0.63 -0.68 -0.50 -1.66 -0.09 -1.27
			2°05	3,55	11,52	6,10	12.81	4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3.67 1.88 1.67 2.18 2.76 2.76 2.76
	A consumination	1950-51	3.24	5.28	18°16 24°91	6.56	12.37	5. 12 5. 13 5. 13 5. 13 5. 13 5. 18 5. 18 5. 18 5. 18	3.87
0.50	1771	Normal	+0.52 +0.52	+0°75	+1.84	10.07	40.96	0.29 0.34 0.20 0.20 0.18 0.56 0.05 0.05 0.05 0.05 0.05 0.05	+0.02 +0.01 +0.05 +0.07 +0.07 +0.15
	The state of the s	Jano	0.92	1,21	14.77	1,573	2.97		0.82 0.16 0.18 0.36 0.37 0.37 0.08 0.37 0.18
		Deco	0.59) Q	5.17 5.88	1.63	2.25	0.85 0.32 0.58 0.61 1.05 1.95 1.95	0.85 0.23 0.23 0.23 0.04 0.07
0301	1970	Nove D			0 0	0	2,29	1,00	1,28 0,18 0,10 0,10 0,10 0,18 0,52 0,14 0,41
	2	Oct.	0.53	1.78	7.53	1,02	7.50	1.04 0.02 0.03 0.13 0.04 0.94 0.94 0.98	0°50 0°50 0°50 0°50 0°50 0°50 0°50 0°50
	F. Jews	ation	5533	3529	3154 5213	4101	2435	4,300 24,88 3664 3893 4,132 4,132 6669 6669 6558	2255 2180 1962 2428 3139 2392 2076 3026
	4 4 6 7	00000	WEST OF DIVIDE Butte (Airport) Phillipsburg	Hamilton	West Glacier Summit (Marias)	Ovendo 1 SW	Thompson Falls Average (8)	0 2 0	Average (9) EASTERN DIVISION Malta Ft. Peck Medicine Lake Circle Billings #2 Miles City Glendive Broadus Average (8)



PRECIPITATION DATA FOR FEBRUARY 1, 1951 NORTHERN WYOMING

1950 1951	ation Jan. Dept. From	ec.		1.19 .28 .77 +.50 2.33 1.81	2 .32 .03 .0933 0.46 1.57	.40 T35 0.50 1.67	3.17 1.04 3.29 3.57 = 1.48 3.35 = 1.48 3.19 3.80 3.21 0.07 = 3.29 1.27 3.48	.57 .00 .05 12 0.84 2.01	T .1631 1.21 2.00	.17 .22 2.13	.51 1.05 .58 .5530 2.69 3.19 -0.50		0.06 0.16 -0.29	.67 .19 .4602 1.69 2.20	.05 .50 18 1.90 2.99	- do 05 Missing 050 040	°47 °28	
1950	Precipitation	Nove		1.19	, S,	010	10°1	.57	.71	89°	1.05		.31	.67	°72	04°	247	1
	Elev-	ation					6950 °		!	6	4021						74850	
	Station		BIG HORN RIVER BASIN	Cody	Lovell	Worland	Thermopolis	Riverton	Dubois	Average	TONGUE RIVER BASIN Sheridan	POWDER RIVER BASIN	Arvada	Metz Rench	Gillette	Nine Mile Creek	Mid West	



MONTANA SNOW SURVEYS FEBRUARY 1, 1951

No. Elev. of Depth
Survey 1951
13A2 5600 Jan. 31 13A5 5250 Feb. 1 13A9 5200 Jan. 23 13A12 3600
12C5 6200 Feb. 7 12D1 7200 Feb. 3 12C2 6250 Feb. 5 12C3 6800 Feb. 6 12C4 8000 Feb. 6 15B2 5250 Feb. 2
13D2 7100 Jan. 31 14D2 5580 Feb. 1 14D1 6575 Jan. 31
15B14 5000 Jan. 29 26. 15B15 4530 Jan. 29 26. 15A13 3800 15B11 3580
Canada 3500 Feb. 5 32.3 Canada Feb. 6 42.6 Canada 5100 Jan. 29 52.1 Canada 5000 Jan. 31 64.7 Canada 4500 Jan. 30 26.6



MONTANA SNOW SURVEYS FEBRUARY 1, 1951

MISSOURI BASIN											
MES DATINATION			Date	Snow		Water Content	ntent	Inches)			
	No.	Eleve	Surger	Depth (Tr)	بر د	Dogt.	December	Average	Ä	Years	Ground
SNOW COURSE			1951		1951		1949	Avg. %A	%Avg.	or Record	Surface Condition
MADISON RIVER											
Hebgen	111155	6550	Jan. 3	31 23.4	5.4	7.7	- C-1	88	99	1.7	8
West Yellowstone	11E7	00/9		K)		6.6	9.7	7.3	110	77	9
21-Mile	11E6	7150		A 1.	10.6	14.5	14.2	10.1	102	77	ធ្វ
	1111111	6500	K	- 7	13.0	14.9	15.1	12.0	109	16	
Island Fark	11610	3600		M)	7,6	12,8	11.6	9,5	76	16	9
Valley View Norris Basin	10.62	7500	Feb.	1 25.6 1 25.6	7°4 6°2	120,0	10.0	8°9	83	9 н	8 8 0 8
CALLATIN RIVER											
Mystic Lake	סמסר	6600	برا ک	C	ri C	o C	7 7	L	0	l.	ſ.
New World	1001	6700		2000	ん ん ん	ว์ห	ο α ο κ	10	102	J	કું હ
21-Mile	11E6	7150		1 36.1	10.6	14.5	14.2	10.01	102	† ††	, ç,
MISSOURI BIVER MAIN STEM											
	1205	6200	Feb.	2		3,1		κ.	001	72	8
	12D1	7200		3 19.6	3.0	107	, r.	300	103	12	යි. සැ
	1202	6250		23	0	7.6	6.3	4.5	122	16	
Tenmile, Middle	1203	0089		31	ထိ	6°9	8.7	6,3	130	17.	0
renmile, Upper	1264	8000	Feb。		10.0	8°7†	10.6	0,8	125	17	8
(Meries River)											
Marias Pass	12B5	5250	Feb.	1 14.6	1	20.6	€/	~	201	1	1
Snow Lab. #16	13.49	5200	S	5 46.0	13.1	21.2	13.4	12,0	83	120	8
UPPER YELLOWSTONE								egithed have I delete			
	400	0		į	(- (,	
Cooks City	いたりに	7/20	Feb. 1	57.5	œ μ	11,6	10.2	0,1 10,1	8 2	9 ı	0
Lake Camp	JOE L	7850		7 2	200	7,0	000	ν, v,	£ ;	v.	0
Luning	LEGE	7400		2 8) ° 0	3 0	τ°ο ο	ر د ر	277	٥	0 0
Lewis Lake Divide	10801	2000		<i>y</i> 0	0 0	- L	0,0	U (p 1	01	8
DD TA TA ON Dom	TOTO T	200		2	55.5	25.65	29°8	20.7	105	55	3



MONTANA SNOW SURVEYS FEBRUARY 1, 1951

MISSOURI BASIN IN WYO	WYOMING										
DRAINAGE BASIN	;	i	Date	Snow		Water Co	Content (Inches			
AND	° o	Elev.	Of	Depth	لة (ا	0,47		Average	Da	Years	Ground
SNOW COURSE			1951		1951		1949	Avg	AVE.	Record	Surface Condition
TIMO TOTAL OTHER T											
(Wind River)											
Brooks Lake #3	10F2	9200	Feb.	1 65.0	22°	21,9	17.3	2	ا ا	bear bear	Ç.
Burroughs Creek	9F6	8800		31 55.2	19	15.3	0,00	14.7	10/2	12	, E
Dinwoodie	9F10	10000			מו	13.5	9,1	11.5	105	'n	, e
Dry Creek	9F9	9500			T.	8,2	5	6,3	8	, K	E
Du Noir	9F2	8750				10.5	6.2	6.7	112	19,	G (4)
Geyser Creek	9F3	8500	Feb	1 31.04	7	0 %	6.3	7.3	106	K	ස
Hobbs Park	962	10000	Jan. 2	27 36.3	. 6	21.4	12,8	14.7	29	\ K	E
Little Warm	9 <u>F</u> 4	9500			17	16.7	0	- 8	- 0	\ CV	G.F.
Mosquite Park	963	9500	Jan. 27		ŗ.	11,8	0	0	77	ω	G. F.
Sheridan Creek R.S.	9F1	7500	Febo		6	6.2	0		154	10	G FF.
St. Lawrence R.S.	9F11	0006	Jan. 2		W	8,1	5.7	5.4	65	ω	E4
T-Cross Ranch	OF5	8000	Jan. 31		7	5.5	0	7.6	167		G. Fr.
Trout Creek	196	8400			p=4	เก เก	0	700	30	K	G. Fr.
Togwotee Pass	9F1	0096	Jan. 3		23	20°7	0	18,1	132	12'	8
Kendall	9F12	2006				MARK THE PARK THE PAR					
Loomis Park	10F5	8500	-			LOWER NOTES					
Black Rock	10F3	8600	Jan. 3	30 64.0	18.5	18.4	15.7	13.8	134	16	0
(Popo Agie River)					3 3 3 3 4 1	entrope TA					
Blue Ridge	862	9500	Jan. 2	26 32.7	7.7	13.8	0	6.8		e	G _° ፑ _°
Grannier Meadows	894	0006	Jan. 25	41	10.2	16.3	11,1	8,4	121	H	GoFo
Larsen Creek	796	0006									
Sawmill Glade	861	8500		30°	200	0	0	1,0	53	01	0
South Pass	863	0006	Jan. 25	5 39.1	10.7	14.9	1107	8,0	120	0	Gr.
Mulligan Park	995	8900			·				!		,
Dutch Joe	926	8700					AAAF IN THE			Constant resign	
BIG HORN RIVER (Wyoming)						militari maa sitti					
	9F8	8000	Jam. 3	28	6.3	6.5	0	6,1	103	К	G FF
Owl Creek	8F1	8700	Jan . 29	9 16.8	4.0	7,9	4.2	4.3	93	'n	压
Tensleep R.S.	7E3	8300			•	Project Opposite rest			`	`	
Timber Creek	9E2	0006	Jan. 30	0.41 0	2.9	3.3	5.0	3.4		K	ភូ
Ranger Croek	7E1	8800		•						`	
Wood Biver	OF7	ROOD									

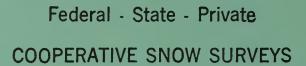


MONTANA SNOW SURVEYS FEBRUARY 1, 1951

MISSOURI BASIN	in WYOMING										
DRAINAGE BASTN			Date	Snow	M	Water Co	Content ((Inches)			
AND	No.	Elevo	Surmon	Depth (In)	ر دولت	1 +000	7	Average	ge Data	Years	Ground
SNOW COURSE			1951	1951		1950	1949	Ave. M.	MAYE.	Record	Surface Condition
SHOSHONE RIVER											
East Entrance	10E6	2000	3	37.3	7.6	8,6	10.7	9.6	98	30	G. Fr.
Sylvan Pass	10E5	7100	Feb. 3	45.7	1104	12,1	10.9	10.6	107	ω	G.F.
TONGUE RIVER											
Burgess R.S.	石町	2900	Feb. 1	36.65	14.3	1	8	8	1		8 0
Big Goose R.S.	752	7700	Feb. 1	13.8	3.1	3	8	9	8	-	ê
Dome Lako	755	8800									
POWDER RIVER							e sadh un i				
Muddy Pass	7E7	9700	Jan. 31	22.8	11.8	0	8	8	0	_	<u>ب</u>
Sour Dough	6F1	8500	•							1	0
Soldier Perk	7E6	8700	Feb. 1	17.8	3.7	1	1	8	0	-	0
CHEYENNE RIVER									And the control of		
(South Dakota)					to of the state of the		alinia alin				
Upper Spearfash	1 S.D	. 6500	Jan. 30	13.9	2.6		Chilled is con-				
Upper Castle	2 S.D.	. 6800	Jan. 30	17.2	ري د د		, in Singuistic				
Deerfield	3 S.D.	0009	Jan. 30	2,3	6.0						







Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"